

CLAIMS

WE CLAIM:

1. A phased array local coil for magnetic resonance imaging comprising:
a set of loops fitting together to define a surface to couple with magnetic flux passing through the surface;
wherein each loop includes a conductor for independently communicating a
5 signal between the loop and an MRI machine; and
wherein each loop is radially asymmetric about a normal to the surface at the loop, the asymmetry selected to provide improved uniformity among the loops of magnetic flux coupling over the surface.
2. The local coil of claim 1 wherein the loops are arranged about a center of the surface and wherein the asymmetry of the loop causes a center of gravity of an area enclosed by each loop to be displaced toward the center of the surface.
3. The local coil of claim 1 wherein the loops are N-sided polygons where N is a number greater than or equal to five.
4. The local coil of claim 1 wherein the loops are arranged in columns and rows with the rows extending along an axis of a polarizing magnetic field of the MRI machine and wherein the loops overlap with loops in adjacent columns and do not overlap with loops in adjacent rows.
5. The local coil of claim 4 wherein there are four loops arranged in two columns and two rows.
6. The local coil of claim 4 wherein the overlap is insufficient to decouple the loops by flux sharing.
7. The local coil of claim 4 further including decoupling circuitry electrically isolating the loops from each other.
8. The local coil of claim 1 wherein the loops are flexible conductors and wherein the phased array coil may conform to an arched space admitting a patient.

9. The local coil of claim 1 having in addition a second phased array local coil of corresponding construction aligned with the phased array local coil to define therebetween a volume that may receive a patient.

10. The local coil of claim 1 further including a grounded ring circumscribing the set of loops and wherein the conductors attached to the grounded ring to follow the grounded ring to a common exit point.

11. A local coil for magnetic resonance imaging comprising:
a set of four loops fitting together in two rows and two columns to cover a generally rectangular surface receiving magnetic flux, wherein portions of the loops at the corners of the rectangular surface cut across the corners to produce an
5 asymmetry in each loop moving the center of gravity of each loop toward the center of the surface;
whereby the coupling of each coil to magnetic flux near the center of the surface is increased.

12. The local coil of claim 11 wherein rows may extend along an axis of a polarizing magnetic field of the MRI machine and wherein the loops overlap with loops in adjacent columns and not with loops in adjacent rows.

13. The local coil of claim 11 wherein each loop includes a conductor for independently communicating a signal between the loop and an MRI machine.

14. The local coil of claim 11 further including a grounded ring circumscribing the set of loops and wherein the conductors are attached to the grounded ring to follow the grounded ring to a common exit point.

15. The local coil of claim 11 further including a decoupling circuit selected from the group consisting of: a capacitive decoupling circuit and a preamplifier decoupling circuit.